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A Duke Energy Company

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October 28, 2004

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Duke Energy Corporation
Oconee Nuclear Station, Units 1, 2, & 3
Docket Nos. 50-269, 50-270, 50-287
McGuire Nuclear Station, Units 1&2
Docket Nos. 50-369 and 50-370
Catawba Nuclear Station, Units 1 & 2
Docket Nos. 50-413, 50-414
Response to NRC Generic Letter 2004-01, Requirements for Steam Generator Tube Inspections

On August 30, 2004, the NRC issued Generic Letter (GL) 2004-01 concerning steam generator tube inspections. The NRC issued the Generic Letter to alert addressees to findings at U. S. power reactor facilities suggesting that certain licensee steam generator tube inspection practices may not meet the NRC's interpretation of the technical specification (TS) requirements in conjunction with 10 CFR Part 50, Appendix B.

The Generic Letter requests that licensees submit a description of the tube inspections performed at their plants, along with an assessment of whether these inspections ensure compliance with the TS requirements in conjunction with 10 CFR Part 50, Appendix B. Duke Energy Corporation (Duke) has concluded that the steam generator tube inspection practices for Oconee, McGuire and Catawba meet the NRC's position regarding the requirements of the TS in conjunction with 10 CFR Part 50, Appendix B.

Pursuant to 10 CFR 50.54(f), Duke's 60-day response to GL 2004-01 is provided in Attachments 1, 2, and 3 for Oconee, McGuire and Catawba Nuclear Stations, respectively.

No commitments are contained in this letter. If you have questions or need additional information, please contact Mary Hazeltine at 704-382-5880.

Very truly yours,

W. R. McCollum, Jr.
Vice President, Nuclear Support

Attachments

A115

I affirm that I, W. R. McCollum, am the person who subscribed my name to the foregoing, and that all the matters and facts herein are true and correct to the best of my knowledge.

Vice President, Nuclear Support

Subscribed and sworn to me: October 28, 2004
Date

Notary Public

My Commission Expires: 03/09/2009
Date

SEAL

BETTY SHARPE GREGORY
NOTARY
My Comm. Exp.
March 09, 2009
PUBLIC
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Attachment 1
Oconee Nuclear Station
Response to Generic Letter 2004-01

**Oconee Nuclear Station Response to GL 2004-01**

Generic Letter 2004-01 Required Information, Response Item 1:

Addressees should provide a description of the SG tube inspections performed at their plant during the last inspection. In addition, if they are not using SG tube inspection methods whose capabilities are consistent with the NRC's position, addressees should provide an assessment of how the tube inspections performed at their plant meet the inspection requirements of the TS in conjunction with Criteria IX and XI of 10 CFR Part 50, Appendix B, and corrective action taken in accordance with Appendix B, Criterion XVI. This assessment should also address whether the tube inspection practices are capable of detecting flaws of any type that may potentially be present along the length of the tube required to be inspected and that may exceed the applicable tube repair criteria.

Response to Item 1 for Oconee Units 1, 2, and 3:

Oconee Nuclear Station Units 1, 2, and 3 have or will have Babcock & Wilcox Canada Replacement Once Through Steam Generators (ROTSG) installed. The Alloy 690 thermally treated tubing is manufactured by Sumitomo. The tubes were hydraulically partial depth expanded (thirteen inches from the tube end) into each of the tubesheets.

Oconee Unit 1 was replaced in September 2003 and has not had an inspection since replacement. Oconee Unit 2 was replaced in March 2004 and has not had an inspection since replacement. Oconee Unit 3 is currently shutdown for its SG replacement outage.

Baseline bobbin preservice inspections of one hundred percent of the tubes were conducted in accordance with the industry guidelines for all Oconee replacement steam generators. Selected bobbin indications of special interest were inspected with specialized probes which have been qualified for the application. No cracking was detected at any of the Oconee Units during these preservice inspections.

Generic Letter 2004-01 Required Information, Response Item 2:

If addressees conclude that full compliance with the TS in conjunction with Criteria IX, XI and XVI of 10 CFR Part 50, Appendix B, requires corrective actions, they should discuss their proposed corrective actions (e.g., changing inspection practices consistent with the NRC's position or submitting a TS amendment request with the associated safety basis for limiting the inspections) to achieve full compliance. If addressees choose to change their TS, the staff has included in the attachment suggested changes to the TS definitions for a tube inspection and for plugging limits to show what may be acceptable to the staff in cases where the tubes are expanded for the full depth of the tubesheet and where the extent of the inspection in the tubesheet region is limited.

Response to Item 2 for Oconee Units 1, 2, and 3:

Steam Generator tube inspections performed at Oconee are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.

Generic Letter 2004-01 Required Information, Response Item 3:

For plants where SG tube inspections have not been or are not being performed consistent with the NRC's position on the requirements in the TS in conjunction with Criteria IX, XI, and XVI of 10 CFR Part 50, Appendix B, the licensee should submit a safety assessment (i.e., a justification for continued operation based on maintaining tube structural and leakage integrity) that addresses any differences between the licensee's inspection practices and those called for by the NRC's position. Safety assessments should be submitted for all areas of the tube required to be inspected by the TS where flaws have the potential to exist and inspection techniques capable of detecting these flaws are not being used, and should include the basis for not employing such inspection techniques. The assessment should include an evaluation of (1) whether the inspection practices rely on an acceptance standard (e.g., cracks located at least a minimum distance of x below the top of the tube sheet, even if these cracks cause complete severance of the tube) which is different from the TS acceptance standards (i.e., the tube plugging limits or repair criteria), and (2) whether the safety assessment constitutes a change to the "method of evaluation" (as defined in 10 CFR 50.59) for establishing the structural and leakage integrity of the joint. If the safety assessment constitutes a change to the method of evaluation under 10 CFR 50.59, the licensee should determine whether a license amendment is necessary pursuant to that regulation.

Response to Item 3 for Oconee Units 1, 2, and 3:

Steam Generator tube inspections performed at Oconee are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.

Attachment 2
McGuire Nuclear Station
Response to Generic Letter 2004-01

**McGuire Nuclear Station Response to GL 2004-01**

Generic Letter 2004-01 Required Information, Response Item 1:

Addressees should provide a description of the SG tube inspections performed at their plant during the last inspection. In addition, if they are not using SG tube inspection methods whose capabilities are consistent with the NRC's position, addressees should provide an assessment of how the tube inspections performed at their plant meet the inspection requirements of the TS in conjunction with Criteria IX and XI of 10 CFR Part 50, Appendix B, and corrective action taken in accordance with Appendix B, Criterion XVI. This assessment should also address whether the tube inspection practices are capable of detecting flaws of any type that may potentially be present along the length of the tube required to be inspected and that may exceed the applicable tube repair criteria.

Response to Item 1 for McGuire Unit 1:

Steam generator tube inspections performed at McGuire Nuclear Station are consistent with the NRC's position regarding tube inspections.

McGuire Unit 1 has four Babcock and Wilcox Canada Model CFR-80 steam generators installed. These steam generators were installed in March 1997. The Alloy 690 thermally treated tubing was manufactured by Sumitomo. The tubes were hydraulically expanded full depth into each of the tubesheets. Low row U bends were stress relieved.

Duke Energy Corporation performed the following steam generator tube inspections at McGuire Nuclear Station during the last inservice inspection in March 2004.

- Bobbin inspections of 100 % of the tubes in the A and D steam generators and 50 % of the tubes in the B and C steam generators.
- Twenty percent of the expansion transitions in the area of two inches above the top of tubesheet to eight inches below the top of tubesheet were inspected with specialized probes which have been qualified for the application.
- Selected bobbin indications of special interest were inspected with specialized probes which have been qualified for the application.

Low row U bends and dents and dings were not inspected at the last inspection outage because flaws at those locations were not expected in accordance with the degradation assessment.

No cracking has been detected in the McGuire Unit 1 steam generator tubes.

Prior to this inspection, a degradation assessment in accordance with NEI 97-06 was performed. This assessment, which includes operating experience, is performed to identify degradation mechanisms that may be present. Duke Energy Corporation uses

tube inspection methods that are capable of detecting flaw types that may be present in accordance with that assessment.

Response to Item 1 for McGuire Unit 2:

Steam generator tube inspections performed at McGuire Nuclear Station are consistent with the NRC's position regarding tube inspections.

McGuire Unit 2 has four Babcock & Wilcox Canada Model CFR-80 steam generators installed. These steam generators were installed in December 1997. The Alloy 690 thermally treated tubing was manufactured by Sumitomo. The tubes were hydraulically expanded full depth into each of the tubesheets. Low row U bends were stress relieved.

Duke Energy Corporation performed the following steam generator tube inspections at McGuire Nuclear Station during the last inspection in March 2002.

- Bobbin inspections of 100 % of the tubes in the B and C steam generators were conducted.
- Selected bobbin indications of special interest were inspected with specialized probes which have been qualified for the application.

Expansion transitions, low row U bends and dents and dings were not inspected at the last inspection outage because flaws at those locations were not expected in accordance with the degradation assessment.

No cracking has been detected in the McGuire Unit 2 steam generator tubes.

Prior to this inspection, a degradation assessment in accordance with NEI 97-06 was performed. This assessment, which includes operating experience, is performed to identify degradation mechanisms that may be present. Duke Energy Corporation uses tube inspection methods that are capable of detecting flaw types that may be present in accordance with that assessment.

Generic Letter 2004-01 Required Information, Response Item 2:

If addressees conclude that full compliance with the TS in conjunction with Criteria IX, XI and XVI of 10 CFR Part 50, Appendix B, requires corrective actions, they should discuss their proposed corrective actions (e.g., changing inspection practices consistent with the NRC's position or submitting a TS amendment request with the associated safety basis for limiting the inspections) to achieve full compliance. If addressees choose to change their TS, the staff has included in the attachment suggested changes to the TS definitions for a tube inspection and for plugging limits to show what may be acceptable to the staff in cases where the tubes are expanded for the full depth of the tubesheet and where the extent of the inspection in the tubesheet region is limited.

Response to item 2 for McGuire Units 1 and 2

Steam generator tube inspections performed at McGuire are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.

Generic Letter 2004-01 Required Information, Response Item 3:

For plants where SG tube inspections have not been or are not being performed consistent with the NRC's position on the requirements in the TS in conjunction with Criteria IX, XI, and XVI of 10 CFR Part 50, Appendix B, the licensee should submit a safety assessment (i.e., a justification for continued operation based on maintaining tube structural and leakage integrity) that addresses any differences between the licensee's inspection practices and those called for by the NRC's position. Safety assessments should be submitted for all areas of the tube required to be inspected by the TS where flaws have the potential to exist and inspection techniques capable of detecting these flaws are not being used, and should include the basis for not employing such inspection techniques. The assessment should include an evaluation of (1) whether the inspection practices rely on an acceptance standard (e.g., cracks located at least a minimum distance of x below the top of the tube sheet, even if these cracks cause complete severance of the tube) which is different from the TS acceptance standards (i.e., the tube plugging limits or repair criteria), and (2) whether the safety assessment constitutes a change to the "method of evaluation" (as defined in 10 CFR 50.59) for establishing the structural and leakage integrity of the joint. If the safety assessment constitutes a change to the method of evaluation under 10 CFR 50.59, the licensee should determine whether a license amendment is necessary pursuant to that regulation.

Response to Item 3 for McGuire Units 1 and 2:

Steam generator tube inspections performed at McGuire are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.

Attachment 3
Catawba Nuclear Station
Response to Generic Letter 2004-01

**Catawba Nuclear Station Response to GL 2004-01**

Generic Letter 2004-01 Required Information, Response Item 1:

Addressees should provide a description of the SG tube inspections performed at their plant during the last inspection. In addition, if they are not using SG tube inspection methods whose capabilities are consistent with the NRC's position, addressees should provide an assessment of how the tube inspections performed at their plant meet the inspection requirements of the TS in conjunction with Criteria IX and XI of 10 CFR Part 50, Appendix B, and corrective action taken in accordance with Appendix B, Criterion XVI. This assessment should also address whether the tube inspection practices are capable of detecting flaws of any type that may potentially be present along the length of the tube required to be inspected and that may exceed the applicable tube repair criteria.

Response to Item 1 for Catawba Unit 1:

Steam generator tube inspections performed at Catawba Nuclear Station are consistent with the NRC's position regarding tube inspections.

Catawba Nuclear Station Unit 1 has four Babcock and Wilcox Canada Model CFR-80 steam generators installed. These steam generators were installed in September 1996. The Alloy 690 thermally treated tubing was manufactured by Sumitomo. The tubes were hydraulically expanded full depth into each of the tubesheets. Low row U bends were stress relieved.

Duke Energy Corporation performed the following steam generator tube inspections at Catawba Unit 1 during the last inspection in November 2003.

- Bobbin inspections of 100 % of the tubes in the A and D steam generators were conducted.
- Twenty percent of the expansion transitions in the area two inches above the top of tubesheet to eight inches below the top of tubesheet were inspected with specialized probes which have been qualified for the application.
- Selected bobbin indications of special interest were inspected with specialized probes which have been qualified for the application.

Low row U bends and dents and dings were not inspected at the last inspection outage because flaws at those locations were not expected based on the degradation assessment.

No cracking has been detected in the Catawba Unit 1 steam generator tubes.

Prior to this inspection, a degradation assessment in accordance with NEI 97-06 was performed. This assessment, which includes operating experience, is performed to identify degradation mechanisms that may be present. Duke Energy Corporation uses

tube inspection methods that are capable of detecting flaw types that may be present according to that assessment.

Response to Item 1 for Catawba Unit 2:

Steam generator tube inspections performed at Catawba Unit 2 are consistent with the NRC's position regarding tube inspections.

Catawba Nuclear Station Unit 2 has four Westinghouse Model D5 steam generators installed. Catawba Unit 2 had operated for 14.7 EFPY at the time of the last steam generator inspection. The tubing is thermally treated Alloy 600. The tubesheets were full depth expanded. Low row U bends were stress relieved.

Duke Energy Corporation performed the following steam generator tube inspections at Catawba Unit 2 during the September 2004 outage:

- Bobbin inspections of greater than 50 % of the tubes in all four steam generators were conducted.
- Selected bobbin indications of special interest were inspected with specialized probes which have been qualified for the application.
- Expansion transitions in the hot leg were inspected with specialized probes which have been qualified for the application. The inspection length was two inches above the tubesheet to nine inches below the tubesheet. Approximately twenty five percent of the tubes were inspected. Indications were detected in one overexpansion in the B SG; it was subsequently removed from service. The over-expanded regions in "A , "B" , "C" and "D" steam generators were inspected. No additional indications were detected.
- Indications were detected in the tubesheet tack expansion region in the hot leg of "B" steam generator. 100% of the hot leg tack expansions in the "B" steam generator and twenty percent of the hot leg tack expansions in the "A", "C", and "D" steam generators were inspected. The area of interest was defined as plus two inches from the tube end. Nine tubes were found in the "B" hot leg with indications. These tubes were removed from service. No additional indications were detected in "A", "C", or "D" steam generators.
- Although the seal weld region is not considered part of the tube, inspection of this region was conducted as part of the expanded inspection of the tubesheet regions detailed above. 188 tubes in the "B" steam generator contained indications on the seal weld. Six tubes were removed from service as a conservative measure because the indications were dispositioned as extending slightly into the tube material. One tube seal weld was found with an indication in the "A" steam generator and seven in the "D" steam generator, no indications were found in the "C" steam generators.
- Approximately twenty five percent of the low row U bends were inspected with specialized probes which have been qualified for the application.

- Approximately twenty-five percent of the dents and dings were inspected with specialized probes which have been qualified for the application.

Prior to this inspection, a degradation assessment in accordance with NEI 97-06 was performed. This assessment, which includes operating experience, is performed to identify degradation mechanisms that may be present. Duke Energy Corporation uses tube inspection methods that are capable of detecting flaw types that may be present according to the degradation assessment.

Generic Letter 2004-01 Required Information, Response Item 2:

If addressees conclude that full compliance with the TS in conjunction with Criteria IX, XI and XVI of 10 CFR Part 50, Appendix B, requires corrective actions, they should discuss their proposed corrective actions (e.g., changing inspection practices consistent with the NRC's position or submitting a TS amendment request with the associated safety basis for limiting the inspections) to achieve full compliance. If addressees choose to change their TS, the staff has included in the attachment suggested changes to the TS definitions for a tube inspection and for plugging limits to show what may be acceptable to the staff in cases where the tubes are expanded for the full depth of the tubesheet and where the extent of the inspection in the tubesheet region is limited.

Response to Item 2 for Catawba Units 1 and 2

Steam generator tube inspections performed at Catawba are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.

Generic Letter 2004-01 Required Information, Response Item 3:

For plants where SG tube inspections have not been or are not being performed consistent with the NRC's position on the requirements in the TS in conjunction with Criteria IX, XI, and XVI of 10 CFR Part 50, Appendix B, the licensee should submit a safety assessment (i.e., a justification for continued operation based on maintaining tube structural and leakage integrity) that addresses any differences between the licensee's inspection practices and those called for by the NRC's position. Safety assessments should be submitted for all areas of the tube required to be inspected by the TS where flaws have the potential to exist and inspection techniques capable of detecting these flaws are not being used, and should include the basis for not employing such inspection techniques. The assessment should include an evaluation of (1) whether the inspection practices rely on an acceptance standard (e.g., cracks located at least a minimum distance of x below the top of the tube sheet, even if these cracks cause complete severance of the tube) which is different from the TS acceptance standards (i.e., the tube plugging limits or repair criteria), and (2) whether the safety assessment constitutes a change to the "method of evaluation" (as defined in 10 CFR 50.59) for establishing the structural and leakage integrity of the joint. If the safety assessment constitutes a change to the method

of evaluation under 10 CFR 50.59, the licensee should determine whether a license amendment is necessary pursuant to that regulation.

Response to Item 3 for Catawba Units 1 and 2:

Steam generator tube inspections performed at Catawba are consistent with the NRC's position regarding tube inspections. Therefore this question does not apply.